RESEARCH HIGHLIGHT

December 2007

Socio-economic Series 07-004

West Hills Subdivision Sustainable Development Charrette

INTRODUCTION

The West Hills residential development in Fredericton, New Brunswick, responds to market demands of active seniors and young families and the growing interest in energy-efficient housing within the community — an interest shared by the developer, Hill Bros. Realty & Investments Ltd.

Hill Bros. was interested in exploring energy efficiency further and in developing more sustainable residential subdivisions. At the time, the City of Fredericton was reviewing its municipal development plan and was interested in learning more about environmental practices that can be integrated into urban design.

The City recognized the potential for an urban design charrette to provide new ideas about sustainable development practices that could influence its municipal planning policies. For Hill Bros., a charrette was an opportunity to explore planning and design options that could be used in West Hills and in future developments.

Hill Bros. was in the early stages of designing the West Hills subdivision, with a golf course at the core of the development. The development was intended to include energy-efficient housing, building on previous successes by Hills Bros. in this area (apartments, homes).

CHARRETTE PLANNING

Held in July 2004, the charrette brought together more than 20 local, regional and national experts for two-and-a-half days. Participants were grouped into three design teams, each led by a facilitator with experience in sustainable design issues. Participants included representatives of Hill Bros., the City of Fredericton, the New Brunswick government and CMHC.

Expertise included landscape architecture; engineering; alternative energy systems; stormwater management; urban and community planning; environmental planning and protection; solar energy and golf course design.

Before the charrette, participants received a design brief with information about the West Hills subdivision, charrette goals and objectives and benchmarking points. Hills Bros provided a preliminary master plan of the West Hills subdivision as the starting point for each team to develop its vision of sustainable development of this land.

Through a website, participants had access to relevant information about the project and other sustainable community projects. Web references and drawings and maps to be used as base information for the charrette were also posted on this site.

CHARRETTE EVENT

During the first evening of the charrette, city planners provided demographic information about Fredericton and the City's municipal plan, the housing market and current and anticipated future issues. Hill Bros. gave a history of the West Hills subdivision, described the landscape features and the site's preliminary master plan. A bus tour showed participants highlights of the area, amenities, transportation corridors and developments around West Hills.

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On the second day, participants were introduced to the structure of the charrette for the remaining two days. They were given presentations about options for energy efficiency and stormwater management. Each team was assigned a work area and given a package of planning information and tools, and principles to consider, which are given below.

At the end of the charrette, each team presented the results of their work.

Principles to consider

The three teams were provided with a list of benchmarks as guidelines for the integration of sustainable development principles into their designs. These were:

1. **General:** Design and management to support community services and recreational activities; a maintained and preserved natural environment; a golf course as central focus for site planning.
2. **Housing:** Include seniors and family homes, low-energy and renewable-energy use, low-maintenance lawns and front gardens, orientation to facilitate solar energy, strategies to reduce potable water consumption.
3. **Movement:** Traffic designs to reduce car use and speed and facilitate transit to surrounding areas; pedestrian and bicycle trails central to movement schemes.
4. **Golf course:** Develop towards community needs; community stormwater management integrated in golf course design; golf course shares infrastructure with recreational activities and community services.
5. **Stormwater:** Integrate within golf course, low-maintenance landscaping, permeable surfaces, reduced use of chemicals and protection of watercourses.

CHARRETTE RESULTS

Green Team

The Green Team's master plan incorporated several key design elements to achieve the charrette's sustainable development principles. The team identified the natural environmental features of the West Hills site and the golf course as two elements with the greatest influence on planning considerations.

The Team recommended applying a recognized environmental management and conservation program to "green" the golf course to protect the natural environment, including the stream that runs through the site. The golf course footprint is as small as possible without compromising normal course standards.

Other Green Team recommendations included:

- serpentine turns on long streets to reduce vehicle speed;
- pedestrian access designed to reduce the use of cars and encourage alternative forms of transportation to reduce air and noise pollution;
- live–work opportunities for the community;
- houses oriented to take advantage of solar energy for heating;
- recreational facilities, including community services, integrated in golf course clubhouse buildings to enhance community interactions;
- access to playgrounds and the golf course so they could be used for winter community activities;
- space for community gardens.

The Team suggested a number of operational strategies for the community design. To reduce "heat islands" the Team recommended gravel parking lots, which would allow infiltration rather than run-off of water. Dual-flush toilets and capturing rainwater for irrigation systems and xeriscaping would encourage water conservation. The Team recommended designing the golf course clubhouse to incorporate community facilities and suggested that the golf course could be used to assist with stormwater management of the developed site.

The Team suggested using measures during construction to prevent soil erosion and compaction, to minimize water and air pollution and to protect a selection of trees.

In addition, the Team recommended monitoring and follow-up programs to determine if strategies were effective.

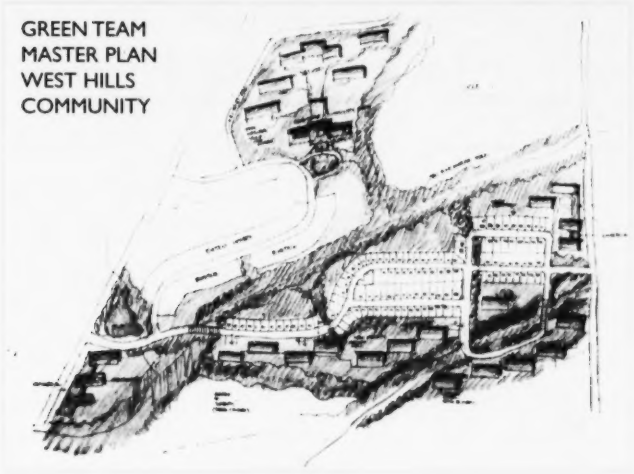

Figure 1 Green Team Master Plan

Red Team

The Red Team used the following vision statement to guide creation of its master plan:

> The goal of this two-and-a-half day design workshop is to create a visual and narrative image for West Hills; a mixed-use, intergenerational neighbourhood designed around natural features that demonstrate sustainable practices in its development and operation, with an emphasis on recreation and active transportation linkages to the rest of the City.

The combined community centre and clubhouse located to the east of the residential areas was the central focus of the Red Team's master plan. A bus route passing through the higher density residential area with a stop at the community centre would facilitate access to the centre. Multi-use trails would connect the residential areas to the community centre and allow for through-connections from Brookside Drive to St. Mary's Drive, two major roads which border the subdivision.

Other Red Team proposals included:

- orienting houses on the southeast corner to allow southern exposure;
- orienting single-family houses along a natural ridge on the site to provide a view of the golf course;
- using geothermal heating for the community centre and some of the surrounding homes as a renewable source of energy and to reduce operating costs;
- establishing a pedestrian path network around the golf course and within the course boundaries to avoid conflict with motorized vehicles;
- placing bike racks at entrances of all destination sites within the West Hills development;
- using permeable surfaces, such as gravel or brick, on driveways and parking areas to retain stormwater run-off through natural infiltration;
- narrowing pavement width as much as possible to reduce impermeable surface areas;
- maintaining natural slopes and groundwater recharge areas so they continue their water management functions;

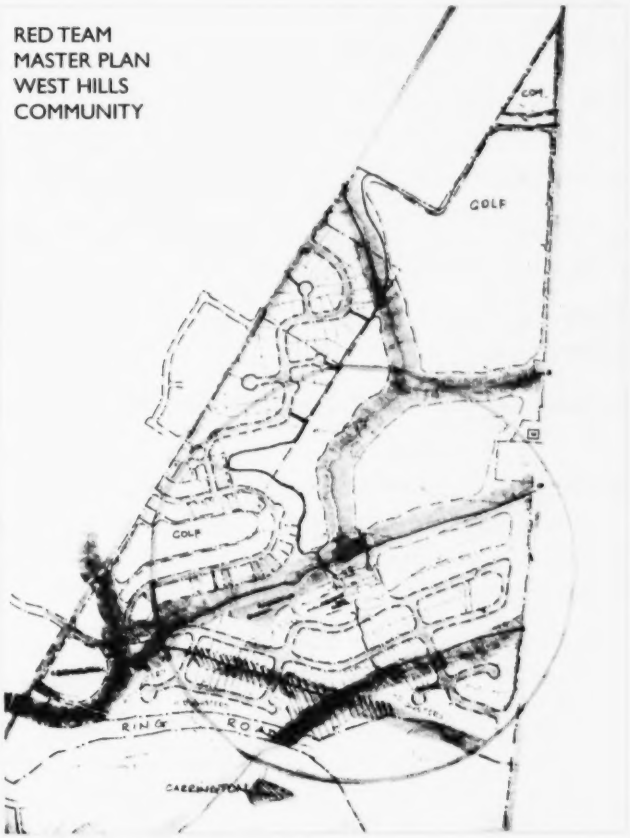

Figure 2 Red Team Master Plan

- exploring alternatives to grass lawns;
- developing a community garden to collect and use organic wastes.

Blue Team

The Blue Team outlined five important elements as the focus of its master plan:

1. Housing and lot forms;
2. Golf course design and role;
3. Clubhouse design and role;
4. Transportation and movement;
5. Infrastructure systems.

The Team agreed that the golf course would be important as a recreational service area and as green space. For the Blue Team, the concept of a golf course was pivotal to the development.

The Blue Team's recommendations include:

- building houses slab-on-grade to eliminate potential mold problems with basements;
- incorporating hydronic heating in the slab floors;
- designing terraced housing designs, with house fronts facing the golf course;
- sharing driveways at the rear of the terraced houses to save space;
- making response to market demand easier by using flexible zoning;
- using a recognized environmental management and conservation program for the golf course, focusing on reduced pesticide use, environmental sustainability, water conservation and wildlife protection.

The master plan included plans for stormwater drainage, water treatment, "green" construction of the clubhouse and shared community facilities to reduce costs.

The Team included a number of other strategies that were not visible on its master plan but contributed to its sustainable development plan. They included:

- using geothermal energy to encourage energy efficiency;
- powering golf carts with solar energy;
- placing walking paths on the outer edge of the golf course and along greenways outside the golf course;
- sloping streets so stormwater would drain towards the southern part of the site;
- designing streetscapes to encourage pedestrian use;
- designing residential areas with narrower streets and fewer facades to allow interaction among residents and bring "eyes to the street;"
- reducing the size of front lawns to encourage more gardens.

For children and seniors, the Blue Team envisioned a safe recreational environment. Playgrounds, exercise and rest areas would be located along a trail system or linear park within the development. The design of the linear park would encourage recreational use in summer (walking, running) and winter (cross-country skiing) and link to a trail network the City is establishing to the north of the West Hills site.

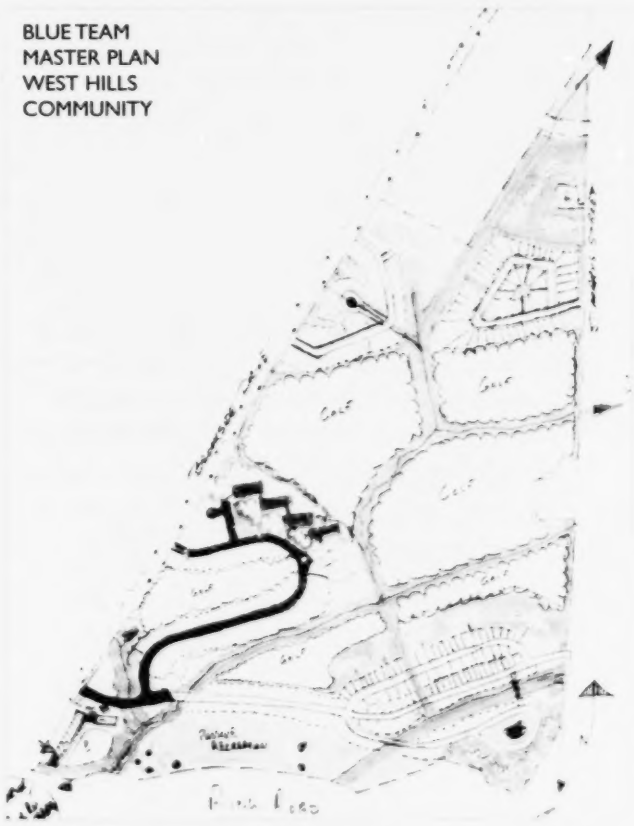

Figure 3 Blue Team Master Plan

NEXT STEPS

The charrette gave participants the opportunity to actively contribute to a sustainable development and design process. The three Teams' master plans provided the City of Fredericton and Hill Bros. with practical and realistic options for integrating sustainable development strategies into a community design.

Feedback from the City of Fredericton and Hill Bros. reinforce the success of the charrette. For the City, the West Hills subdivision is a great example of a developer leading the way to a more environmentally sustainable development that appeals to the public. For Hill Bros., the charrette provided new ideas for the design of the West Hills subdivision.

Since the charrette, green spaces and natural features have been integrated into the stormwater management plan and Hills Bros. is considering implementing other ideas from the charrette in the development.

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Housing Research at CMHC

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